

REMARKS

Review and reconsideration on the merits are requested.

Claims 1, 3-6 and 8-10 were rejected under 35 U.S.C. § 112, second paragraph. The Examiner considered the language “capable of being used as” to be indefinite.

In response, claims have been amended to recite the step of identifying substances and thicknesses of the coated layers and an order of formation of layers that provide an optically coherent multi-layered film-coated powder having the desired characteristics. The claim amendments also include conforming amendments to claims 1, 3, 4, 6, 8, 9 and 10.

It is respectfully submitted that the claims as amended fully comply with 35 U.S.C. § 112, and withdrawal of the foregoing rejection is respectfully requested.

Claims 1, 3-6 and 8-10 were rejected under 35 U.S.C. § 103(a) as being unpatentable over EP 1 066 818 A1 (EP ‘818). EP ‘818 was previously cited as disclosing the preparation and use of optically coherent multilayered film coated powders, including a base and at least two coated layers having refractive indices differing from one another. Although acknowledging that EP ‘818 does not specifically disclose the claimed equations, the Examiner considered that it would have been obvious to optimize and conform the parameters and properties of the powders of EP ‘818 to the claimed equations.

More particularly, the Examiner did not consider Applicants’ response (to the effect that the prior art does not teach specific steps such as measuring the spectral intensity curve and obtaining substances and thicknesses that minimize color differences) to be persuasive. In this regard, the Examiner commented that steps such as measuring the spectral intensity curve, and selecting materials of thicknesses of the layers are an (established) part of the process of the design for optical multi-layered films, as well as optimizing such parameters to fit a desired

function. The Examiner concluded that the claimed steps would have been obvious to one of ordinary skill in the art.

Applicants respectfully disagree with the Examiner's conclusion that the claimed steps are conventional. For instance, the prior art relied upon by the Examiner does not disclose the step of identifying substances and thickness of the coated layer and an order of formation of the layers that minimize a color difference expressed by Equation (3) and which make a hue ratio expressed by Equation (4), among other requirements of the present claims.

For this reason alone, it is respectfully submitted that the claimed processes are patentable over EP '818.

The significance of the claimed method steps is demonstrated by reference to a flowchart of the film thickness calculation shown below. An example calculation is also given. Surely, EP '818 discloses multi-layered film coated powders, but what is missing from EP '818 is disclosure of a process of obtaining a desired optically coherent multi-layered film-coated powder by measuring specified values in a spectral intensity curve, and identifying substances and thicknesses of a plurality of coated layers and an order of formation thereof that minimizes any resulting color difference. None of this is taught by EP '818, which is further evidence of the unobviousness the claimed processes.

The diagram (flowchart) is illustrated as follows.

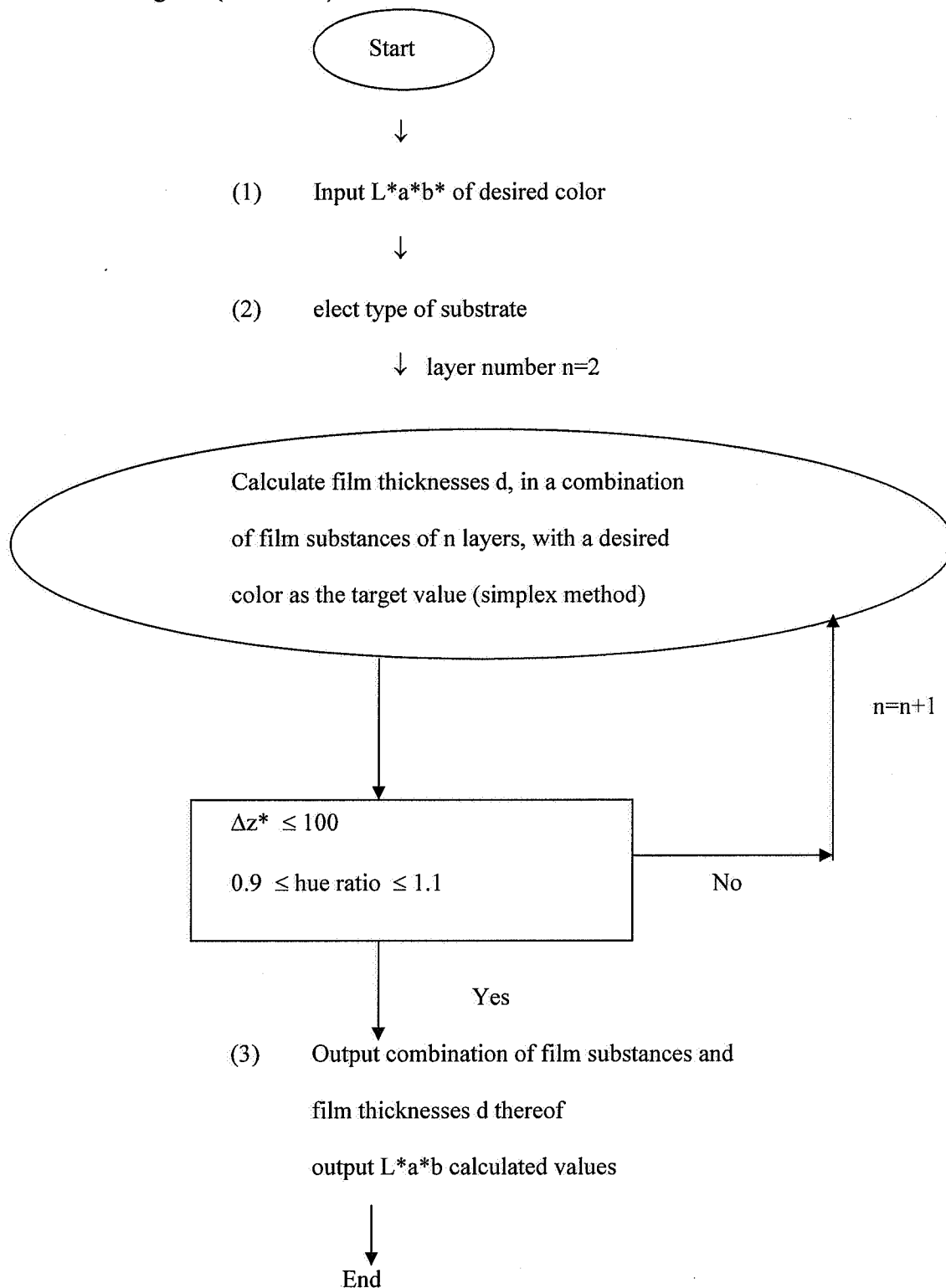


Diagram: Flow chart of film thickness calculation

Preliminarily Inputted Data (Required Data):

- Data of refractive index of film material (for example, TiO_2 , Al_2O_3 , SiO_2 , and the like).
- Data of refractive index (resin powder, inorganic oxide, iron powder, and the like) of particles (base particles) to be coated.

Items Required as Prerequisites (Items to be Inputted):

- L^* , a^* , and b^* of a targeted color (for example, cyan: $L^* = 52$, $a^* = -19$, and $b^* = -30$).
- Type and particle diameter (for example, 4 μm -iron powder) of particles to be coated (basic particles).

In the case where $L^* = 52$, $a^* = -19$, and $b^* = -30$ are inputted in (1) of the Diagram and an iron powder of 4 μm is inputted in (2) of the Diagram, combinations of inputted film materials are checked to find a combination of AZ^* and color difference that matches the discrimination conditions by employing a simplex method. In the case where combinations of two layers do not satisfy the conditions, investigations using 3 layers is conducted. In the case where the conditions are not satisfied by a 3 layer structure, the number of layers is increased to 4 layers, 5 layers, etc. When a combination that satisfies the conditions is found, the structures and thicknesses of the films are outputted.

In Examples of the present specification, the combination found to satisfy the conditions is as follows.

	Film Material	Film Thickness
First Layer	SiO_2	96.8 nm
Second Layer	Al_2O_3	75.1 nm
Third Layer	TiO_2	74.7 nm

The values of L^* , a^* , and b^* of particles which were actually obtained by coating in accordance with the above-specified combination were $L^* = 52.67$, $a^* = -17.78$, and $b^* = -27.30$, which were considerably close to the designed values.

For the above reasons, it is respectfully submitted that the present claims are patentable over EP '818, and withdrawal of the foregoing rejection under 35 U.S.C. § 103(a) is respectfully requested.

Withdrawal of all rejections and allowance of claims 1, 3-6 and 8-10 is earnestly solicited.

In the event that the Examiner believes that it may be helpful to advance the prosecution of this application, the Examiner is invited to contact the undersigned at the local Washington, D.C. telephone number indicated below.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,



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